

Translation

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PATENT COOPERATION TREATY

PCT/EP2003/002174



PCT

10/506553

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002/G001	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/002174	International filing date (day/month/year) 04 March 2003 (04.03.2003)	Priority date (day/month/year) 05 March 2002 (05.03.2002)
International Patent Classification (IPC) or national classification and IPC C08L 59/00, C08K 7/14, 5/50, 5/56		
Applicant TICONA GMBH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 26 September 2003 (26.09.2003)	Date of completion of this report 07 May 2004 (07.05.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International Application No.

PC/EP2003/002174

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-34, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

☒ the claims:

pages _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages 1-14, filed with the letter of 16 February 2004 (16.02.2004)

☐ the drawings:

pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 83/02174

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-14	YES
	Claims		NO
Inventive step (IS)	Claims	1-14	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

2. Citations and explanations

Reference is made to the following document:

D1: PATENT ABSTRACTS OF JAPAN vol. 018, no. 625
(C-1279), 29 November 1994 & JP 06 240105 A
(POLYPLASTICS CO), 30 August 1994 &
JP 06 240105 T (POLYPLASTICS CO) 30 August 1994

D1 discloses a polymer compound containing: (A) 100 parts by weight of polyacetal; (B) 1 to 100 parts by weight of an anhydride-modified polyolefin; (C) 0.01 to 5 parts by weight of an esterification catalyst; and (D) 0 to 150 parts by weight of a filler (PAJ abstract). The esterification catalyst can be a tetrabutylzirconate or a tetrabutyltitanate (paragraph 0006 and example 12, paragraph 0012 and table 3). Since the impact resistance of the polymer is improved (PAJ abstract), the anhydride-modified polyolefin can also be considered an impact resistance modifier. Thus component (B) of D1 is covered by the claimed additives b) in claim 1. Cited example 12 contains 100 parts by weight of (A), 20 parts by weight of (B) and 0.2 parts by weight of (C), resulting in approximately 83 wt % (A), 17 wt % (B) and 0.0016 wt % (C) (table 3).

Claim 1 differs from D1 in that a compound selected from the group comprising phosphonium salts, phosphanes, sulphonium salts, titanyle compounds and mixtures thereof is used as catalyst c).

Therefore claim 1 is novel over D1 (PCT Article 33(2)).

The applicant indicates that the addition of a claimed catalyst improves the binding of additives, such as impact resistance modifiers, for example, without impairing the mechanical properties of the polyacetal.

The problem addressed by D1 was to improve the compatibility between the two resin components; it is possible to consider one of the two, i.e. component (B), as additive b) according to claim 1 of the present invention. The integration of the additive was thus improved, so improving the impact resistance in D1 without impairing the mechanical properties of the polyacetal resin (abstract; see also paragraphs [0001] to [0003]). Thus in D1 the above problem was solved by using tetrabutylzirconate or tetrabutyltitanate. The comparative examples in the present application do not show any advantages over tetrabutyltitanate of the use of the catalyst selected in claim 1.

Therefore the problem addressed by the invention can be considered that of devising alternative polyoxymethylene shaping compounds with good integration of the additive and good mechanical properties.

Like tetrabutyltitanates, the catalysts used as per the invention are known as catalysts for esterification reactions. However, since the applicant shows that some esterification catalysts (e.g. boric acid) do not solve the problem of interest, it can be assumed that an arbitrary selection of an esterification catalyst would not solve the problem of interest. None of the citations prompts a person skilled in the art to select the claimed phosphonium salts, phosphanes, sulphonium salts or titanyl compounds from the general group of esterification catalysts in order to solve the problem of interest.

Therefore an inventive step can be recognized (PCT Article 33(3)).

Claims 2 to 11 are dependent on claim 1 and hence likewise meet the PCT novelty and inventive step requirements.

Claims 12 and 13 differ from D1 in that the polyacetal shaping compound is a glass fibre bundle which is covered with one or a plurality of layers of the polyacetalhomo- or copolymer.

Therefore claims 12 and 13 are likewise novel over D1 (PCT Article 33(2)).

Claims 12 and 13 solve the problem of improving the integration in a polyacetal matrix of a filler in the form of a glass fibre bundle. Neither D1 nor any of the other international search report citations proposes solving this problem by using a catalyst that catalyses a chemical reaction between the polyacetalhomo- or copolymer and the surface of the reinforcing fibres.

Therefore claims 12 and 13 involve an inventive step (PCT Article 33(3)).

Claim 14 uses the shaping compounds as per claim 1 or claim 12 to produce the shaped object claimed. Therefore claim 14 also meets the requirements of PCT Article 33(2) and (3).